



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,881	05/30/2001	Douglas C. Watson	NIKOP002/PA0 327	8984
22434	7590	02/02/2004	EXAMINER	
BEYER WEAVER & THOMAS LLP P.O. BOX 778 BERKELEY, CA 94704-0778			JOHNSTON, PHILLIP A	
			ART UNIT	PAPER NUMBER
			2881	
DATE MAILED: 02/02/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/870,881

Applicant(s)

WATSON ET AL.

Examiner

Phillip A Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/8/03
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☒ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Examiners Response to Arguments

1. Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,510,755 to Higuchi, in view of Lo, U.S. Patent No. 6,252,705 and in further view of Trost, U.S. Patent No. 5,784,925, for the reasons given in First Office Action.

2. Applicant's arguments filed 12-08-2003 have been fully considered but they are not persuasive.

Argument 1.

Applicant states, that "None of Higuchi, Lo, and Trost discloses all elements of the claims as amended. More specifically, none of Higuchi, Lo, and Trost discloses an airbearing structure and workpiece/reticle holder each configured to operate while exposed to the same vacuum environment.

Each of claims 1, 11, 25, 28, and 30 are therefore patentable over the cited prior art for at least this reason."

The applicant is respectfully directed to Higuchi (755), Column 11, line 50-67; and Column 12, line 1-47, which states; FIG. 4A is a top plan view of a third embodiment of a stage mechanism according to the invention, and FIG. 4B is a longitudinal section view of the third embodiment. A step direction in FIG. 4A is

Art Unit: 2881

regarded as the X axis. The X stage according to the present embodiment is similar in structure to the first embodiment and thus the description thereof is omitted here. By the way, of the component elements of the X stage according to the third embodiment, like elements as in the first embodiment are given the same designations.

Also, driving of the x stage, similarly to the first embodiment, is executed by an air servo cylinder through a drive rod connected to a stage base plate 4. However, as in the second embodiment, the X stage can also be driven by an actuator disposed outside the vacuum chamber through the X-axis slide shafts. The third embodiment is characterized in that, as a Y stage (in the scan direction) actuator, there is used an air servo cylinder 41, while the air servo cylinder 41 is disposed in the interior portion of a vacuum chamber 40. This can enhance the drive force of the Y stage and thus can enhance the moving speed and acceleration of the Y stage.

To each of the two slide shafts 3 of the X stage, there is fixed a Y-axis air slide bearing 42 which extends in a direction perpendicular to the slide shaft 3 through the stage base plate 4. Each Y-axis slide shaft 43 is driven by the air servo cylinder 41 with the air slide bearing 42 as a guide (guide beam) thereof.

The one-side end portions of the two slide shafts 43 concentric with each other are respectively fixed to a mask stage base plate 44 in the center of the vacuum chamber 40. The other-side end portions of the two slide shafts 43 operate as pistons in the cylinders 41a, 41b of the air servo cylinder 41. The air servo cylinder 41 is disposed so as to cover the end portions of the two slide bearings 42. And, the pressures of the cylinders 41a, 41b arranged in the two right and left end portions of

Art Unit: 2881

the air servo cylinder 41 are changed relatively to thereby control the slide shafts 43 and thus move the mask stage base plate 44. On the vacuum chamber 40, there are provided projecting portions 40a so as to cover the movable range of the air servo cylinder 41 (in FIG. 4A, it moves in the step direction).

In case where the projecting portions 40a are connected to the main body of the vacuum chamber 40 in this manner, when compared with a case where the whole of the mechanism is covered with a rectangular-shaped chamber, the capacity of the vacuum chamber can be reduced and the time necessary to reach a given level of vacuum can be thereby shortened.

The slide surface of the air slide bearing 42 with respect to the slide shaft 43 (translational structure) is similar in structure to that shown in FIG. 2. That is, the slide surface includes air pads (not shown) for floating up the slide shaft using air, and suction grooves 45, 46 which exhaust the air used by the air pads to thereby maintain the vacuum of the interior portion of the vacuum chamber. The suction grooves 45, 46 are respectively arranged on the mask stage (work piece holder) base plate 44 side of the slide surface of the air slide bearing 42; and, the suction groove 45 having a large width reduces the atmospheric pressure down to a given pressure, while the suction groove 46 having a small width exhausts the air so as to reduce the given pressure almost down to the vacuum of the interior portion of the vacuum chamber.

The examiner has interpreted from the Higuchi (755) reference above that the translational structure has an air bearing structure and a work piece holder, which

moves freely in one degree of freedom along a guide beam, and all are operational in the same vacuum chamber.

Conclusion

3. The Amendment filed on 12-08-2003 under 37 CFR 1.131 has been considered but is ineffective to overcome the Higuchi (755), Lo (705) and Trost (925) references.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip A Johnston whose telephone number is 703 305 7022. The examiner can normally be reached on 7:30 to 4:00.

Art Unit: 2881

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ
January 15, 2004


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2000